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Mixed siliceous-carbonate sedimentation in a late cretaceous epeiric sea: New evidence from the eastern Russian platform

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, Germany. The knowledge of mixed siliceous–carbonate sedimentary rocks requires significant extension. Lithological and geochemichal peculiarities of the Late Turonian–Middle Campanian deposits have been examined in the Mezino-Lapshinovka section of the Uljanovsk-Saratov Trough (eastern Russian Platform). Three main lithologies are gaizes (a kind of mixed siliceous–carbonate rocks), marls, and claystones. These include opal-CT, calcite, and clay minerals in different proportions. The Fe content in the rocks varies from 4480 ppm to 49350 ppm. The Mn content is lower in gaizes than in marls. Carbon isotope values vary slightly through the Late Turonian–Early Santonian (2.38-3.75 ‰); the δ13C values decrease sharply to-3.84 ‰ in the latest Coniacian claystones and again increase in the Campanian marls. The documented mineralogy and geochemical proxies permit to establish fluctuating water oxygenation in the epeiric sea that embraced the study territory, to hypothesize input of volcanic material from distant sources (the North Atlantic and the Black Sea regions), and to confirm the relative sea-level rise in the Campanian. The weak oxygen depletion in the form of establishment of non-sulfidic (ferruginous) conditions is interpreted for the latest Coniacian on the basis of the siderite and hematite presence (1-2%), the high Fe content (49350 ppm), and the high Fe/Al ratio (1.96). This regional event is related hypothetically to the Ocean Anoxic Event 3 (OAE3). Together with the evidence from the other regions, this interpretation implies possible global extent of the OAE3.

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Keywords

Geochemical proxies, Late cretaceous, OAE3, Siliceous rocks, Uljanovsk-saratov trough

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